

# Feed allowance information

All those useful numbers updated – now feed allowance requirements (includes 6% feed wastage)

Based on the latest research results, calculated 'eaten' feed demand is altered by 0-7% compared to previous DairyNZ (Dexcel) Feed Demand figures. The differences are largely due to an increase in the energy required for milk production (now includes the energy to maintain the udder as well as the direct energy cost of the milk) as per the published equations for ME requirements, Brookes & Nicol, Chapter 10, NZSAP Occasional Publication No.14. The ME requirements for pregnancy have been increased by 58% above the published equations, to align with the latest research results for cow feed intake in late pregnancy, as reported by Roche et al. (J. Dairy Sci. 88:677-689).

The feed requirement figures are 'eaten' feed demand plus 6% to allow for feed wastage observed under good feeding conditions of pasture in farmlet trials. Where feed (pasture or supplement) wastage rates are higher than those stated, requirements for feed offered need to be increased. The requirements are calculated for feed that is 11 MJ ME/kg DM.

(The estimates have been peer reviewed by Dr J Roche, Dr C Holmes and Dr J Bryant and agreed to by industry experts)

## Daily energy requirements of lactating cows (MJ ME)

The requirements are calculated for pasture at 11 MJ ME/kg DM. For different pasture quality make the following adjustments to calculate ME or DM requirements:

- ME requirements add/subtract 4% per MJ ME below/above 11.0 MJ ME/kg DM
- DM requirements add/subtract 14% per kg DM below/above 11.0 MJ ME/kg DM

### Maintenance MJ ME/day

LWT (kg)						
300	350	400	450	500	550	600
40	45	50	54	59	63	68

### Walking MJ ME/km walked

MJ ME/ km walked		
Flat	Rolling	Hilly/Steep
2.0	3.0	6.0

### Milk solids MJ ME/kg MS

MJ ME/kg DM	Breed		
	Jersey	JxF	Friesian
10	81	84	86
11	77	80	82
12	74	77	79

### Pregnancy MJ ME/day

	Weeks before calving				Annual Total
	12	8	4	2	
Jersey (J)	11	18	32	42	2840
JxF	12	21	37	48	3240
Friesian (Fr)	13	23	41	54	3610

### Liveweight MJ ME/kg LWT change

Dry Cows		Milkers	
LWT Gain	LWT Loss	LWT Gain	LWT Loss
72	-30	50	-37

### Kg LWT/Condition Score (CS)

Kg LWT/CS = 6.58% of Cow LWT					
Cow Lwt	350	400	450	500	550
Kg/CS	23	26	30	33	36

### Example:

Daily requirements of a 450 kg JxF cow, producing 2.0 kg MS/day and losing 0.5 kg LWT/day at 12 MJ ME/kg DM

Maintenance	54
Walking on flat (3 km x 2MJ ME/km)	6
Milk solids (2.0 kg MS x 80 MJ)	160
LWT loss (0.5 kg LWT x -37 MJ)	-19
<b>Total MJ ME at 11 ME</b>	<b>201</b>
ME requirements reduced by 4% as 12 ME fed = 201 x 96%	193
<b>Total kg DM Eaten (193 ÷ 12 ME)</b>	<b>16.1 kg DM</b>

### Example:

Daily requirements of a 450 kg JxF dry cow, 12 weeks before calving and gaining 0.5 kg LWT/day (½ CS in 30 days) at 11 MJ ME/kg DM

Maintenance	54
Pregnancy	12
LWT gain (0.5 kg LWT x 72 MJ)	36
<b>Total MJ ME</b>	<b>102</b>
<b>Total kg DM Eaten (102 ÷ 11 ME)</b>	<b>9.3 kg DM</b>

## Total daily dry matter requirements lactating cows

Daily milking cow requirements: 11 MJ ME/kg DM

	Kg LWT	kg MS/cow/day				
		1.0	1.2	1.4	1.6	1.8
J	350	11.1	12.5	13.9	15.3	16.7
J	400	11.5	12.9	14.3	15.7	17.2
JxF	450	12.2	13.4	14.8	16.2	17.6
Fr	500	12.8	14.3	15.8	17.3	18.8
Fr	550	13.3	14.8	16.3	17.8	19.3

Note: No walking or LWT loss or LWT gain included

Daily milking cow requirements: 12 MJ ME/kg DM

	Kg LWT	kg MS/cow/day				
		1.4	1.6	1.8	2.0	2.2
J	350	12.2	13.5	14.7	15.9	17.2
J	400	12.6	13.9	15.1	16.3	17.6
JxF	450	13.0	14.3	15.5	16.7	18.0
Fr	500	13.9	15.2	16.5	17.8	19.1
Fr	550	14.3	15.6	16.9	18.2	19.5

Note: No walking or LWT loss or LWT gain included

## Dry cow daily dry matter requirements

Maintenance and pregnancy

No condition score (CS) gain - 11 MJ ME/kg DM autumn pasture

	Kg LWT	Weeks Pre-calving			
		12	8	4	2
J	350	5.0	5.7	6.8	7.7
J	400	5.5	6.3	7.6	8.5
JxF	450	6.0	6.8	8.3	9.3
Fr	500	6.5	7.4	9.0	10.1
Fr	550	7.0	8.0	9.6	10.8

Note: Dry matter requirements have been rounded up to the nearest "5".

The pasture requirements are based on good feeding conditions. For other feeds there is a small allowance of 6% for wastage. Where wastage rates are higher, the requirements need to be increased accordingly.

Maintenance, pregnancy and gaining 1 CS in 60 days

No CS gain in last month of pregnancy - 11 MJ ME/kg DM autumn pasture

	Kg LWT	Weeks Pre-calving			
		12	8	4	2
J	350	7.8	8.5	9.7	10.8
J	400	8.8	9.5	10.8	12.0
JxF	450	9.7	10.5	12.0	13.2
Fr	500	10.7	11.5	13.1	14.3
Fr	550	11.6	12.5	14.2	15.4

Note: These requirements include an allowance for wastage under good feeding conditions.

## Dry cow requirements for condition score gain

Dry cow requirements: kg DM/CS gain

Note: Live weights are for the cow only and exclude the weight of the foetus

Breed	Kg LWT	Pasture		Pasture Silage		Maize Silage Average	Maize Silage High Grain	Grain	PKE	Molasses
		Spring	Autumn	Good	Poor					
		MJ ME/kg DM								
		12.0	11.0	10.5	9.0	10.5	10.8	12.5	11.0	11.5
J	350	115	170	150	210	145	140	100	135	120
J	400	130	200	175	240	170	160	115	155	140
JxF	450	145	220	195	275	190	180	130	170	155
Fr	500	160	250	220	305	210	200	145	190	175
Fr	550	180	275	240	340	235	220	160	210	190

Note: Dry matter requirements have been rounded up to the nearest "5".

The pasture requirements are based on good feeding conditions. For other feeds there is a small allowance of 6% for wastage. Where wastage rates are higher, the requirements need to be increased accordingly.

## Dairy cow annual requirements

Annual requirements tonnes DM/cow/year at 11 MJ ME/kg DM

Breed	Kg LWT	Milk solids production (kg MS/cow/year)						
		250	300	350	400	450	500	550
Jersey	350	3.7	4.0	4.4	4.7			
Jersey	400	3.9	4.2	4.6	5.0	5.3		
JxF	450		4.5	4.9	5.3	5.6	6.0	
Friesian	500			5.2	5.6	5.9	6.3	6.7
Friesian	550			5.4	5.8	6.1	6.5	6.9

Note: These requirements include an allowance for wastage under good feeding conditions.

## Young stock requirements

Young stock target live weights - kg

Breed	Mature Lwt Kg	Age in months				
		3	6	9	15	22
		% of Mature Live Weight Target				
		20%	30%	40%	60%	90%
Jersey	350	70	105	140	210	315
Jersey	400	80	120	160	240	360
JxF	450	90	135	180	270	405
Friesian	500	100	150	200	300	450
Friesian	550	110	165	220	330	495

Young stock total dry matter requirements: 11 MJ ME/kg DM

Breed	Mature Lwt Kg	Total Kg DM		
		3-10	11-22	3-22
Jersey	350	765	2240	3005
Jersey	400	860	2520	3380
JxF	450	960	2800	3750
Friesian	500	1050	3070	4120
Friesian	550	1145	3340	4485

Young stock daily dry matter requirements: 11 MJ ME/kg DM

Breed	LWG Kg/day	kg DM/hd/day at 11 MJ ME/kg DM							
		Age in Months (% of mature LWT)							
		3 (20%)	6 (30%)	9 (40%)	15 (60%)	18 (73%)	21 (86%)	22 (90%)	
Jersey	0.45	2.8	3.5	4.3	5.8	6.6	7.8	8.7	
JxF	0.55	3.2	4.2	5.1	6.8	7.8	9.2	10.1	
Friesian	0.64	3.7	4.8	5.8	7.8	8.7	10.3	11.3	

## Pasture allocation to meet requirements

Dry cows

	Residual	Hours Grazed
Cows Underfed	Less than 1050 kg DM/ha Less than 3.5 clicks	< 3 hours
Maintenance	1100 kg DM/ha 4.5 clicks	3 hours
Gaining weight ½ CS in 30 days	1300 - 1400 kg DM/ha 5.5 - 6.5 clicks	Cows haven't reached target residual at 4pm
Gaining weight ½ CS in 30 days Grass + maize silage or PKE or grain	1200-1300 kg DM/ha 5.0 - 5.5 clicks	

Lactating cows - after balance date

	Pre-Graze Cover	Residual	Grazing Time
Cows underfed	Less than 2400 kg DM/ha	Less than 1450 kg DM/ha Less than 7 clicks	2-3 hours per 12 hour break
Cows underfed	More than 3300 kg DM/ha (feed quality limiting energy intake)	1500 - 1600 kg DM/ha 7-8 clicks	
Well fed	2500 - 3200 kg DM/ha	1500-1600 kg DM/ha 7-8 clicks	4 hours plus per 12 hour break

Note: Grazing covers are expressed as "clicks" on the Rising Plate Meter (RPM) or in kg DM/ha based on the winter formula (clicks x 140 + 500) and are for ryegrass dominant pastures. Balance date is when pasture supply = demand

## Calculating pasture allocation

Key to achieving grazing residuals and feeding cows is getting the right pre-graze cover

How to calculate target pre-grazing cover

(Stocking rate x Pasture Intake x Rotation) + Optimum residual = Pre-grazing Cover

( \_\_\_ cows/ha x \_\_\_ kgDM/cow x \_\_\_ days) + \_\_\_ kg DM/ha = \_\_\_ kgDM/ha

e.g. (3.0 cows/ha x 17.5 kg DM/cow x 22 days) + 1500 kg DM/ha = 2650 kg DM/ha

How to convert to kg DM/ha to RPM clicks

(Grazing cover - Constant) divided by the Multiplier = Clicks

e.g. Winter Formula Constant = 500; Multiplier = 140

Pre-grazing cover height in clicks = (2650-500)/140 = 15.4 clicks

Post-grazing cover height in clicks = (1500-500)/140 = 7 clicks

# Feed supply information

All those useful numbers

For more information on feeds refer DairyNZ Farm Fact 1-50

	DM %	ME MJ/kg DM	CP % DM	NDF % DM	SSS % DM	Starch %SSS	Fat % DM
<b>PASTURE</b>							
Pasture, spring	12-15	11.5-12.5	20-30	35-45	7-25	2-4	4-6
Pasture, summer	15-20	9.5-10.5	14-22	42-52	7-25	2-4	3-5
Pasture, summer dry	20-30	9.0-10.0	9-14	52-65	7-15	2-4	2-4
Pasture, aut/winter	13-18	11.0-11.5	15-20	40-47	7-25	2-4	3-5
<b>SILAGE</b>							
Pasture, good	30-35	11.0	17.0	45-50	3-5	7	3.0
Pasture, poor	33-40	9.0	12-14	53-57	3-5	8	3.1
Baleage	35-45	9.5-10.5	12-17	50-55	5-10	2-4	3.0
Barley	30-35	9.0	11.0	52-60	20	100	2.9
Lucerne	20	9.5	18-22	50-60	2-5	45	3.5
Maize, high grain	33-38	10.8-11.0	8.0	42-45	35	100	3.1
Maize, low grain	28-35	10.3-10.5	8.0	49	30	100	3.1
Pea	33	9.0-9.5	13-16	59	20	35	3.3
Whole crop Silage 1	35-40	8.5-10.5	8.5-12	55-60	16-20	100	3.6
<b>HAY</b>							
Pasture, good	85	9-10	15-20	50-58	10-15	2-4	2.6
Pasture, poor	85	7-8	5-10	60-70	5-10	2-4	2.6
Barley straw	87	6-7	4-5	80	5-8	100	1.9
Pea straw	85	7-8	6	59	-	-	-
Wheat straw	89	6-7	3-4	79	7-9	100	1.8
<b>GRAZED CROPS 1</b>							
Kale	11-15	11.0-13.5	12-1				